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PCT App. No.: PCT/FI2004/000058

Claim Listing

- 1–19. (cancelled)
20. (new) An apparatus for treatment of stock passing to a headbox of a paper machine, comprising:
- a short circulation of the paper machine;
 - a first stock chest;
 - a hydrocyclone plant forming a part of the short circulation, the hydrocyclone plant connected to the first stock chest by a first stock transporting line, the hydrocyclone plant having an accept outlet line; and
 - a second stock chest having a second stock transporting line, wherein the accept outlet line joins the second stock transporting line to form a third stock transporting line which is connected in stock supplying relation to the headbox, and wherein the accept outlet line joins the second stock transporting line so as to mix stock flowing along the accept outlet line with stock flowing along the second stock transporting line.
21. (new) The apparatus of claim 20, wherein the first stock chest contains stock containing broke.
22. (new) The apparatus of claim 21, wherein the stock in the first stock chest contains, in addition to broke pulp, recovered fiber pulp, and mechanical pulp.
23. (new) The apparatus of claim 20, wherein the second stock chest contains stock which has been cleaned by hydrocyclones.
24. (new) The apparatus of claim 23 wherein the second stock chest stock comprises recycled fiber or chemical pulp.

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25. (new) The apparatus of claim 20, further comprising;
a wire pit connected between the first stock chest and the hydrocyclone plant;
a deaeration tank having a discharge;
a wire water supply line connecting the wire pit to the deaeration tank;
a machine screen connected to receive wire water from the deaeration tank; and
a dilution water inlet header, in wire water receiving relation to the deaeration tank
and in dilution water supplying relation to the head box.

26. (new) The apparatus of claim 25, further comprising;
a first pump connected between the first stock chest and the wire pit;
a second pump connected between the wire pit and the hydrocyclone plant;
a third pump connected between the wire pit and the deaeration tank; and
a fourth pump connected between the deaeration tank discharge and the dilution inlet
header.

27. (new) The apparatus of claim 20, wherein the second stock transporting line
extends to a mixing device, and the mixing device is connected in stock receiving relationship
to the accept outlet line, and wherein the mixing device is connected to the third stock
transporting line which is connected in stock supplying relation to the headbox through a
stock inlet header of the headbox; and wherein the third stock transporting line includes:
a deaeration tank having a discharge line;
a pump connected to said deaeration tank discharge line and having a pressure side;
and
a machine screen which is connected to the pressure side of said pump and which is
connected to the stock inlet header of the headbox.

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28. (new) The apparatus of claim 20, further comprising:
a wire pit connected between the first stock chest and the hydrocyclone plant; and
a dilution water line from the wire pit which joins the accept outlet line and the
second stock transporting line at a mixing device in supplying relation to the
third stock transport line.

29. (new) The apparatus of claim 20, further comprising:
a mixing device between the first stock chest and the hydrocyclone, the mixing device
forming part of the first stock line;
a second mixing device where the accept outlet line joins the second stock
transporting line to form a third stock transport line which is connected in
stock supplying relation to the headbox;
a first pump in the first stock line between the first stock chest and the first mixing
device; and
a second pump in the first stock line between the first mixing device and the
hydrocyclone.

30. (new) The apparatus of claim 29, further comprising a wire water line
connected to a source of wire water in the paper machine, the wire water line including a wire
pit followed by a deaeration tank, wherein after the deaeration tank the wire water line forms
a first branch connected to the first mixing device, a second branch connected to the second
mixing device, and a third branch connected to a pump and further to a machine screen and
therefrom further to a dilution water inlet header in dilution water supplying relation to the
head box.

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31. (new) A method for treating stock passed in a short circulation to a headbox of a paper machine comprising the steps of:

passing a first flow of stock to a hydrocyclone plant, and forming an accepts flow of stock;

combining the accepts flow with a second stock flow in the short circulation of the paper machine to form a combined stock flow; and

passing the combined stock flow to the headbox of the paper machine.

32. (new) The method of claim claim 31, wherein the first flow of stock is supplied from a first stock chest.

33. (new) The method of claim 31, further comprising the step of forming the first flow of stock as a composition containing broke passed from the paper machine.

34. (new) The method of claim 31, further comprising the step of forming the first flow of stock as a composition containing broke passed from the paper machine and pulp coming from fiber recovery or mechanical pulp.

35. (new) The method of claim 32, wherein the second stock flow is taken from a second stock chest into which stock which has been cleaned by a hydrocyclone is passed.

36. (new) The method of claim 31, wherein the second flow of stock contains recycled fiber or chemical pulp.

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37. (new) A method for reducing the energy used in a short circulation in a papermaking machine wherein a headbox is supplied stock from an inlet header and wherein the inlet header is supplied with stock from at least a first stock chest of stock which has not passed through a hydrocyclone and a second stock chest of stock which has passed through a hydrocyclone, the method comprising the steps of:

cleaning stock from the first stock chest with a hydrocyclone to form an accepts flow of stock;
mixing the accepts flow of stock with a flow of stock from the second stock chest to form a mixed stock; and
supplying the mixed stock to the inlet header of the headbox.

38. (new) The method of claim 37, further comprising the step of forming the stock in the first stock chest from broke passed from the paper machine.

39. (new) The method of claim 37, further comprising the steps of:
recovering wire water from the papermaking machine; and
diluting the stock from the first stock chest with said wire water to less than or equal to 1 percent consistency before cleaning the stock from the first stock chest with the hydrocyclone to form the accepts flow of stock.